CLAIMS

1. (Currently Amended) Apparatus comprising

at least first and second reactive loads,

a first circuit means that generates a first switching signal and includes switching elements with respective control terminals,

a second circuit means that generates a second switching signal and includes switching elements with respective control terminals,

means for generating a first PWM signal that includes a fundamental switching band signal component of the first switching signal and that further includes a baseband signal and for applying said first PWM signal to said control terminals of said first circuit means,

means for generating a second PWM signal that includes a fundamental switching band component of the second switching signal that has substantially the same magnitude and phase as the fundamental switching band component of said first PWM signal, and that further includes a baseband signal that is the inverse of said baseband signal that is included in the first PWM signal, and for applying said second PWM signal to said control terminals of said second circuit means,

~~means for generating first and second switching signals each having respective switching band components and at least one respective baseband component, and~~

~~means for applying said first and second switching signals to said first and second reactive loads, respectively,~~

~~wherein the means for generating functions so as to work with the means for applying to generate the switching signals in such a way that a) the sum of the values of the instantaneous currents through said each load is substantially zero, b) substantially all of said at least one baseband component of said first switching signal is a current that flows into said first reactive load and c) substantially all of said at least one baseband component of said second switching signal is a current that flows into said second reactive load,~~

wherein at least one of said reactive loads is a ~~transducer~~capacitive load.

2. Canceled.

3. (Currently Amended) The invention of claim 1 wherein the first and second circuit means function so as to work with the means for generating a first PWM signal and with the means for generating a second PWM signal to generate the switching signals in such a way that a) the sum of the values of the instantaneous currents through said each load is substantially zero, b) substantially all of said at least one baseband component of said first switching signal is a current that flows into said first reactive load and c) substantially all of said at least one baseband component of said second switching signal is a current that flows into said second reactive load,

~~there are N of said loads and wherein for each of a number of signal variables for each load, the sum of the values of each particular signal variable is substantially constant.~~

4. (Currently Amended) The invention of claim 3 wherein there are N of said loads, wherein for each of a number of signal variables for each load, the sum of the values of each particular signal variable is substantially constant, and wherein said number of signal variables is greater than 1 and less than N.

5. (Currently Amended) The invention of claim 1 wherein respective first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being connected to a fixed potential.

6. (Currently Amended) The invention of claim 5 wherein each of said reactive loads has a second terminal and wherein said apparatus further comprises means for applying at least the baseband components of said first switching signal between the second terminal of said first reactive load and said common node and for applying at least the baseband components of said second switching signal between the second terminal of said second reactive load and said common node.

7. (Currently Amended) The invention of claim 1 further comprising a mechanical load connected to said ~~transducer~~capacitive load.

8. (Original) The invention of claim 7 wherein said mechanical load includes means for generating acoustic sonar signals.

9. (Currently Amended) The invention of claim 1

~~Apparatus comprising~~

~~at least first and second reactive loads,~~

~~means for generating at least first and second switching signals, each having respective switching band components and at least one respective baseband component,~~

~~means for applying said first and second switching signals to said first and second reactive loads, respectively,~~

wherein the first and second circuit means function ~~means for generating functions~~ so as to work with the means for generating a first PWM signal and with the means for generating a second PWM signal ~~applying~~ to generate the switching signals in such a way as to cause a) substantially the same amount of current at baseband frequencies that flows out of one or more of said reactive loads at a given time to flow into one or more of the others of said reactive loads, b) substantially all of said at least one baseband component of said first switching signal to be a current that flows into said first reactive load and c) substantially all of said at least one baseband component of said second switching signal to be a current that flows into said second reactive load.~~,~~

~~wherein at least one of said reactive loads is a transducer.~~

10. (Currently Amended) The invention of claim 9 further comprising means for connecting respective first terminals of each of said reactive loads to a common power supply node through which said current at baseband frequencies flows.

11. (Currently Amended) The invention of claim 10 wherein each of said reactive loads has a second terminal and wherein said apparatus further comprises means for applying at least the baseband components of said first switching signal between the

second terminal of said first reactive load and said common node and for applying at least the baseband components of said second switching signal between the second terminal of said second reactive load and said common node.

12. (Withdrawn-Currently Amended) The invention of claim 11 wherein said apparatus is further adapted to drive a third reactive load with a third switching signal, said third switching signal having switching band components and at least one baseband component, said third reactive load having a second terminal, and wherein said apparatus further comprises means for applying the at least one baseband component of said third switching signal between the second terminal of said third reactive load and said common node.

13. (Currently Amended) The invention of claim 9 wherein said reactive loads have substantially equal impedance and wherein said baseband components are the inverse of one another.

14. (Currently Amended) The invention of claim 9 wherein said apparatus further includes at least one power supply terminal and wherein said current flowing out of one or more of said reactive loads flows away from said power supply terminal and said current flowing into one or more of the others of said reactive loads flows toward said power supply terminal.

15. (Original) The invention of claim 14 wherein the phases and amplitudes of said baseband components are such that said currents add to zero at substantially all times.

16. (Currently Amended) The invention of claim 14 wherein respective first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being at a fixed potential.

and second signal paths, respectively, in such a way that at least one switching band component of said first switching signal and at least one switching band component of said second switching signal cancel each other and therefore are substantially isolated from said reactive loads.

25. (Original) The invention of claim 24 wherein alternating polarity currents flow in said first signal path in response to said first switching signal and alternating polarity currents flow in said second signal path in response to said second switching signal.

26. (Previously Presented) The invention of claim 24 wherein

said at least one switching band component of said first switching signal and said at least one switching band component of said second switching signal are the fundamental frequency components of said first and second switching signals, respectively, and are of substantially the same amplitude and phase, and

said means for applying comprises a common-mode inductor in said first and second signal paths.

27. (Withdrawn-Currently Amended) The invention of claim 21 wherein said apparatus is further adapted to drive a third reactive load with a third switching signal, wherein said switching amplifier includes at least a third signal path containing said third reactive load, and wherein said apparatus further includes means for applying said first, second and third switching signals to said first, second and third signal paths, respectively, in such a way that at least one switching band component of each of said first, second and third switching signals cancel each other and therefore are substantially isolated from said reactive loads.

28. (Withdrawn) The invention of claim 27 wherein alternating polarity currents flow in said first signal path in response to said first switching signal, alternating polarity currents flow in said second signal path in response to said second switching

signal, and alternating polarity currents flow in said third signal path in response to said third switching signal.

29. (Withdrawn) The invention of claim 27 wherein

said at least one switching band component of said first, second and third switching signals are of substantially the same amplitude and phase, and

said means for applying comprises a common-mode inductor in said first, second and third signal paths.

30. (Currently Amended) The invention of claim 21 wherein

each of said reactive loads includes a first terminal and a second terminal,

the first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being adapted to be connected to a fixed potential,

each said path includes filtering circuitry connected to the second terminal of the respective reactive load, and

each of said first and second switching signals comprises an alternating polarity signal impressed across said first and second signal paths, respectively.

31. (Currently Amended) The invention of claim 21 wherein

each of said reactive loads includes a first terminal and a second terminal,

the first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being connected to a fixed potential,

each said path includes filtering circuitry connected to the second terminal of the respective reactive load, and

said first and second switching signals comprise respective signals at first and second potentials applied to the filtering circuitry of said first and second signal paths, respectively.

32. (Currently Amended) The invention of claim 31 wherein

said second potential is substantially equal to said fixed potential, and

said filtering circuitry includes at least one energy storage element that stores energy when each said switching signal is at said first potential and that supplies energy to said reactive loads when each said second node is connected to said second potential.

33. (Previously Presented) The invention of claim 32 wherein

said energy storage element is a common-mode inductor having first and second ports in said first and second paths, respectively, and

said first and second switching signals have respective fundamental switching band components that are of substantially equal magnitude and phase that are canceled by said common-mode inductor.

34.- 62. Canceled.

63. (Currently Amended) A switching amplifier operating at a particular switching frequency, the switching amplifier comprising

at least first and second circuit paths,

each of said paths comprising switching circuitry, a load filter, a respective port of a common-mode inductor and a transducer, all connected in series, each transducer having a terminal that is connected to a power supply node in common with each other transducer, each load filter having a passband that includes said particular switching frequency and having a stop band at frequencies higher than said particular switching frequency,

said switching circuitry being operative in response to a first pulse-width-modulated signal to cause first and second voltages of a first switching signal to be alternately impressed between the load filter of said first circuit path and said common node and being further operative in response to a second pulse-width-modulated signal to cause first and second voltages of a second switching signal to be alternately impressed between the load filter of said second circuit path and said common node,

said first and second switching signals having respective fundamental switching components that are of substantially equal magnitude and phase so that they are canceled

by said common-mode inductor, said first and second switching signals each further having at least one respective baseband component, the baseband components of said first and second switching signals being such that substantially the same amount of current at baseband frequencies flowing out of one or more of said transducers at a given time flows into one or more of the others of said transducers, and

substantially all of said at least one baseband component of said first switching signal being a current that flows into one of said transducers and substantially all of said at least one baseband component of said second switching signal being a current that flows into another of said transducers.

64. (Original) The invention of claim 63 wherein the phases and amplitudes of said baseband components are such that said currents add to zero at substantially all times.

65. (Previously Presented) The invention of claim 63 wherein said transducers have substantially equal impedance and wherein said baseband components are the inverse of one another.

66. (Previously Presented) The invention of claim 63 wherein said switching amplifier includes at least one power supply terminal and wherein said current flowing out of one or more of said transducers flows away from said power supply terminal and said current flowing into one or more of the others of said transducers flows toward said power supply terminal.

67. (Previously Presented) The invention of claim 63 wherein there are two of said transducers having substantially equal impedances and wherein the baseband components of said first and second switching signals are of substantially equal magnitude and are substantially the inverse of one another.

68. (Previously Presented) The invention of claim 67 wherein a mechanical load is connected to at least one of said transducers.

69. (Original) The invention of claim 68 wherein said mechanical load includes means for generating acoustic sonar signals.

70 - 78. Canceled